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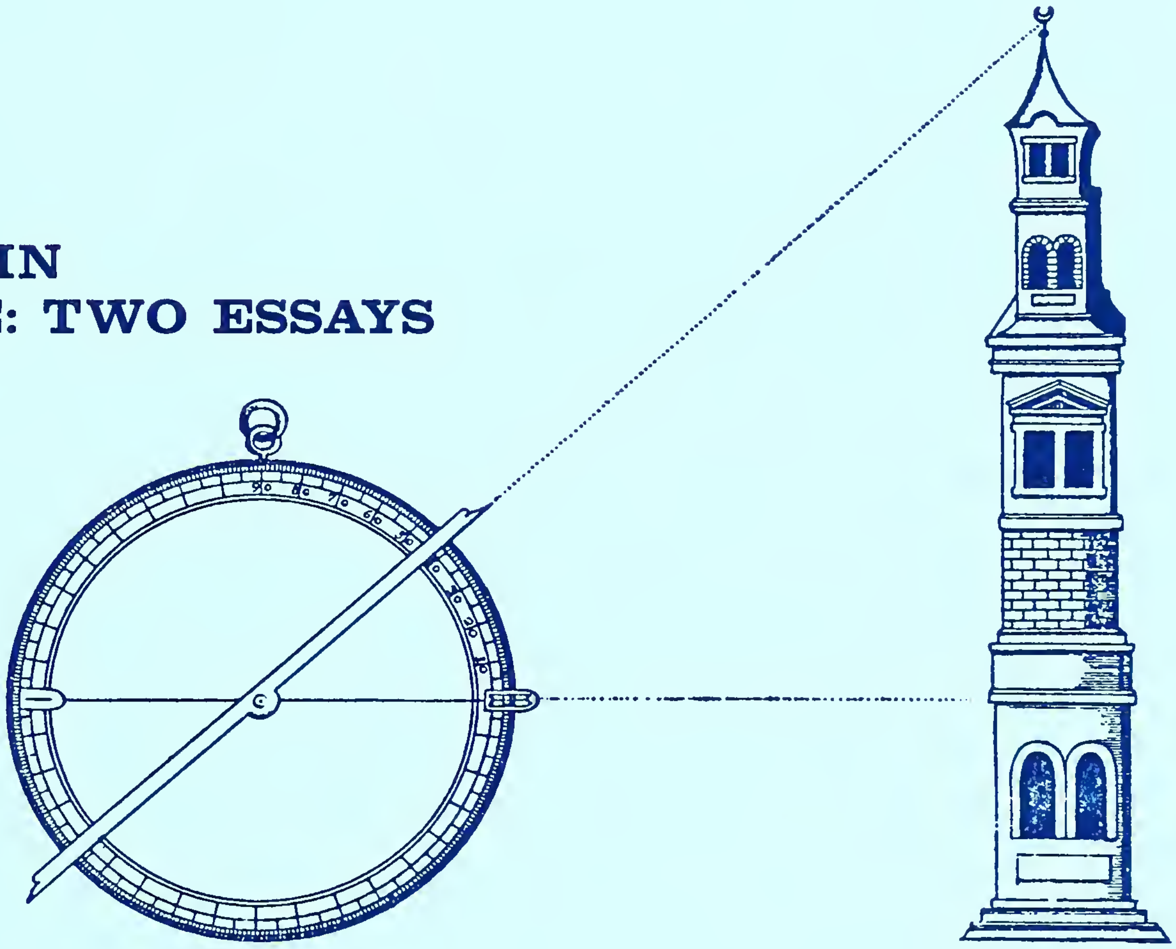

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Research Paper Number 16

September, 1967

School of Arts and Sciences Research Papers
Georgia State College Atlanta, Georgia

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1853

PREFACE

Stereotyped images in various fields are frequently easily come by and soon acquire the aura of Holy Writ. Literature is no exception. Two commonly accepted pronouncements are that Geoffrey Chaucer knew little astronomy and John Donne is the high priest of the Metaphysical School of poetry. The essays following are offered by two of the devil's advocates as possible evidence against the canonization of these views.

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MODERNITY AND SCHOLARSHIP IN CHAUCER'S *TREATISE ON THE ASTROLABE*

by

RAYMOND A. COOK and ROBERT HAYS

Each morning the navigators of the ships at sea rise before the sun and peer into the sky. Each evening the commercial fishermen thumb through the tide-table to determine the time of the next neap. Throughout the day and night the equatorial transit of the Naval Observatory in Washington, D. C., is pointed at the sky. Nightly the giant telescopes at the Mount Wilson, Palomar, and Yerkes Observatories are directed upward. Finally, the launching pads of space rockets are swarming with men preparing for another "count-down." The people who are engaged in these various activities are concerned with the motions of the earth, sun, moon, planets and stars, for upon the precise calibration of such celestial phenomena depends much of the complicated activity of our time.

If the preceding facts should seem an unfitting introduction to an investigation of a treatise on an obsolete instrument, written by a medieval English poet, let us reconsider; for this paper is a humble testimony to the versatility and genius of Geoffrey Chaucer, who has helped to convey to us a heritage incomprehensible to the modern layman who sets his watch by the radio or who determines his geographical position by consulting a touring map or an attendant at the nearest filling station. In the examination of the *Astrolabe,* we are peering into one of the little-known corners of Chaucer's mind, quite modern in its grasp of certain celestial phenomena. Nearly all Chaucerian critics hold that the *Treatise on the Astrolabe* is mainly a redaction of the *Compositio et Operatio Astrolabii* of Messahala and the *De Sphaera* of Sacrobosco, with some sections unaccounted for.[1] In addition, the general consensus is that, though the *Treatise on the Astrolabe* is of interest as evidence of Chaucer's thinking about the education of the young, it is of little importance in demonstrating his knowledge of astronomy.[2] Recognizing the fact that Chaucer knew the sources mentioned, we believe his grasp and applicaton of celestial phenomena to have been equal, or perhaps superior, to his few contemporaries who may have understood anything of the use of the astrolabe.

A knowledge of astronomy and the involved mechanics of the astrolabe was extremely rare. For example, the numerous references in medieval literature to Ptolemy's *Almagest* do not often signify a general understanding of the work, but merely an allusion to a famous work on astronomy handed down from past ages. Even in the twentieth century, where there is no end of research facilities, what proportion of the casual references to such works as the *Almagest* or to Newton's *Principia* denotes a thorough knowledge of these works?

Though Chaucer speaks of himself in the "Prologue" to the *Astrolabe* as merely an ignorant translator of old astronomers, we may reasonably ascribe much of what he says to professional modesty. Indeed, in the very next sentence he tells "Little Lewis," the child for whom the *Astrolabe* was written, that one reason he has performed his labor is to correct some conclusions that do not work out properly from the treatises he has heretofore seen.

Every reader of Chaucer is to some extent familiar with the Ptolemaic system of astronomy. Some explanations of the system in the *Astrolabe* reveal a striking modernity of concept with reference to the determinaion of time and terrestrial location. The following quotation is essential to the understanding of the *Astrolabe:*

> a. The earth is stationary.
>
> b. The heavenly bodies have been projected outward, along lines which extend from the center of the earth, to a sphere of infinite radius called the *celestial sphere.*
>
> The celestial sphere has the following characteristics:
>
> a. Its center is at the center of the earth.
>
> b. Its equator is on the projection of the earth's equator.
>
> c. With respect to the earth, the celestial sphere rotates from east to west about a line which coincides with the earth's axis. Accordingly, the poles of the celestial sphere are at the prolongations of the earth's poles.
>
> . . . .
>
> e. With the important exception of bodies in the solar system, which change position slowly, all heavenly bodies remain practically fixed in their positions on the celestial sphere . . . and accordingly are often called *fixed stars.*

If the lines just quoted seem to be a translation of Ptolemy's *Almagest* or of Chaucer's *Astrolabe,* one may be surprised to learn that they are quoted from a recent edition of the "K & E" *Solar Ephemeris and Surveying Instrument Manual.*[3]

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[1] For several discussions of Chaucer's indebtedness to Sacrobosco and Messahala, see F N. Robinson, ed., *The Works of Geoffrey Chaucer* (2nd edition, Boston: Houghton Mifflin Company, 1957, pp. 544, 867; Walter B. Veazie, "Chaucer's Text-book of Astronomy; Johannes de Sacrobosco," *University of Colorado Studies in the Humanities* (1939-1941), 1, Series B, 169ff; S. W. Harney, "Chaucer's Debt to Sacrobosco," *Journal of English and Germanic Philology,* XXXIV (1935), 34-38; R T. Gunther, *Chaucer and Messahala on the Astrolabe* (Oxford University Press, 1932), *passim.*

[2] See above sources, *passim.*

When we are prompted to scoff at the inadequacies of the Ptolemaic view, let us remember that it is the most reasonable reconciliation of the motions of the heavens that a person might make without the use of a theodolite or equatorial transit. We know now that the stars are not set on the surface of a single sphere, nor do we assign each of the planes to a sphere of its own. But let us examine the reasoning of Ptolemy, of Sacrobosco, of Messahala, of Chaucer. The Naval Observatory in Washington can demonsrate that the stars *do move,* even with great velocities with respect to each other. But so incredibly distant are these stars that their movements cannot be determined by observations taken with an instrument that is not accurate to less than the nearest minute of arc. To the medieval user of the astrolabe, the stars appear to lie on a plane, or rather upon a single surface. The realization that the stars move with respect to each other is quite a sophisticated conclusion, even in our day. Indeed, it is so complicated a conclusion that two of the most practical aspects of applied astronomy, terrestrial surveying and the navigation of ships at sea, choose to disregard it entirely.

The observations of the motion of the sun, moon, and planets are so old as to defy ascription to a particular source. That Chaucer, and Ptolemy before him, were aware of planetary motion against the backdrop of the stars is not subject to doubt. In the attempt to resolve this motion into understandable terms, the bodies of the solar system were assigned to separate spheres of their own. Indeed, should we take the modern telescope from the hands of the observer, he could hardly reach any other conclusion. *The American Nautical Almanac* for the current year gives the rate of change per day in the positions of the sun, Venus, Saturn, Jupiter, and Mars. The rate of change of the moon per *hour* is also given. The astronomical tables are significant for our purposes, for they show that the rates of change of position are in exact accordance with the ordering of the spheres to which these "planets" were assigned in the *Astrolabe.* In part II, paragraph 35, of the treatise, we are given a method for determining these motions. That Chaucer knew of the relation of the spheres to their sizes is evident from his poem " The Complaint of Mars," for the comparative sizes and velocities of the spheres of Mercury, Venus, and Mars are made the basis of most of the action. What is of great interest here is that the concept foreshadows one of the basic principles of modern astronomy, namely, Kepler's Second Law of Motion, expressed as follows: "As the planet describes its orbit, its radius vector traverses equal areas in equal times."

Part II, paragraph 2, speaks of one of the primary uses of the astrolabe—the observation of the angular height, or altitude, of celestial bodies. The term *altitude* as conceived by Chaucer is still in use by those concerned with celestial measurement. The altitude of a celestial body refers to the angular distance from that body to the point directly below it on the horizon. In modern celestial study, taking this "sight" is accomplished by a sextant or other instrument which selects the nearest point of the horizon to the star or other body. The astrolabe provided for taking exactly the same type of measurement in a slightly different manner. The "reule" of the astrolabe, a bar of metal revolving about a pin, had a sight on each end. By pointing the rule toward the celestial body, one was able to determine the angle formed between the rule and the horizontal. Such an action would reveal the altitude of the body.

In "The Nun's Priest's Tale," Chaucer had written of a remarkable rooster, Chauntecleer, who, besides other enviable accomplishments, is able to take "sights" of the sun and convert his observations into local time. Chauntecleer's ability is described as follows:

> By nature he knew ech ascencioun
> Of the equynoxial in thilke toun;
> For whan degrees fiftene weren ascended,
> Thanne crew he, that it mighte nat been amended.

Truly, this was a remarkable creature! Determining time in such a manner is a simple matter for the modern observer with tables for each day. But this wonderful bird has his own "built-in" celestial tables. In addition he could apparently automatically include in his observations the complicated equation of time (related to Kepler's Second Law) which might have made him "miscrow" by as much as fifteen minutes had he disregarded it. In Part II, paragraphs 2, 3, 11, of the *Astrolabe,* Chaucer demonstrates to little Lewis the meththod of determining the time of day by use of the astrolabe, by taking measurement of the sun, just as Chauntecleer had done. Of course, for the modern marine observer, "sights" of the sun have little importance in time-determination. To take time from the sun on a ship is to "put the cart before the horse." The determination of time is a task reserved for the scientist in the observatory. Marine clocks, or chronometers, are set by radio signals. Such signals must originate in observatories, and it is there that time is regulated by celestial observation. There are three important factors in this process: the time, the position of the observer, and the position of a celestial body with reference to that observer. Knowledge of any two of these will suffice to determine the third. In the *Astrolabe,* part II, paragraph 11, Chaucer offers methods to manipulate all three of the aforementioned factors. If it be objected that the tables to which Chaucer referred were engraved on the surface of the astrolabe, and would, therefore, be inaccurate, then it must be answered that the time itself would be inaccurate, and the errors would sometimes cancel each other out. What Chaucer offers in this section is a method of approximation with no more accuracy than is reasonably necessary. Despite the inherent inaccuracies of Chaucer's system, we cannot deny respect for this medieval poet, who could tell time without a twenty-one-jewel wrist watch.

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[3] *Solar Ephemeris and Surveying Instrument Manual* (New York: Keuffel & Esser Company, 1957), pp. 72-73.

In part II, paragraph 13, Chaucer describes one of the most important principles of modern celestial navigation—the determination of the altitude of the sun on the meridian, a meridian being a great circle of the celestial sphere. The acceptance of one inference is basic to this procedure: a line drawn from the observer to the sun on the meridian is the north-south line. If this concept can be grasped with understanding, there is little difficulty with the postulates which spring from this axiom. However, it is nothing less than amazing that anyone born before the development of modern science could arrive at this conclusion as an inviolate rule.

Meridian observations of the sun are extremely important in present-day navigation and in the compilation of observatory tables as well. So accurate are these observations that time may be determined to the nearest one-hundredth of a second by the use of the meridian transit. The altitude of the sun on the meridian told Chaucer three things:

1. the direction of the north-south line through the position of the observer, unless the sun should be directly overhead. In Chaucer's case, the sun on the meridian was always to the south, for he tells us the latitude of his position was over 50° N.
2. the latitude of the observer, the computation of which Chaucer demonstrates in the *Astrolabe.*
3. the time of local apparent noon.

Observations of the sun, planets, and stars on the meridian must have been very important in early efforts to locate positions, because these observations are entirely independent of time when latitude is sought. In modern celestial navigation, the sextant is aimed at the horizon and the sun is sighted in a mirror. Then the sun is followed by moving a vernier. When the altitude of the sun no longer increases, the sun is on the meridian, the sextant is read, and in a matter of minutes, the observer's latitude is known. This is still the most accurate method of finding latitude at sea. So important is this principle that the captain of every vessel in the United States Navy must be informed of the noon position by his navigator when that position is determined. There is only one real difference between the method of the astrolabe and the modern method: Chaucer's declination, i.e., the angular distance of a celestial body from the celestial equator, was found on the back of the astrolabe; the modern navigator obtains his declination of the sun from tables in *The Nautical Almanac.* Meridian sights on the sun served another purpose for Chaucer which is seldom applied today. To check the computations of his astrolabe, Chaucer needed only to observe meridian transits of the sun for several days, for he already knew his position. It is nevertheless true that a modern sextant may be inspected for accuracy in the fashion outlined by Chaucer, but there are quicker methods.

In part II, paragraph I, Chaucer indicates the time of the vernal equinox in 1391 to be about March 12.[4] This section of the *Astrolabe* is particularly interesting in that it calls to mind a passage in the "Prologue" to the *Canterbury Tales* which concerns the date on which the pilgrimage began. In the opening lines Chaucer writes that people love to go on this pilgrimage when ". . . the yonge sonne/Hath in the Ram his halve cours yronne." Later, in the "Introduction" to "The Man of Law's Tale," the date is given as the eighteenth of April for the second day of the pilgrimage. These two sections have created a problem for many students of Chaucer for the following reason: The sign of the Ram (Aries) indicates the time of the vernal equinox to be about March 12 by the old-style calendar. If the sun has proceeded halfway in the sign (each sign occupying approximately thirty days), this date would be March 12 plus fifteen days, or March 27. But this date is twenty-two days removed from April 18, the date expressly given in the "Introduction" to "The Man of Law's Tale." Critics have generally attempted to account for this discrepancy by saying that the passage about the "yonge sonne" should be construed to mean that the sun has ended the *second* half of his journey in Aries.[5] This explanation is hardly satisfactory, however, for March 12 plus thirty days adds to April 11. Even should we assume Chaucer to mean that persons did not have the urge to go on pilgrimages until the very day before their departure (a highly unlikely assumption), there still remains a discrepancy of six days between April 11 and April 17, the day the pilgrims actually started on their journey. By April 18 the sun would be several degrees in the sign of Taurus, yet Chaucer states only that the sun had proceeded in the *Ram.*

Since Chaucer has numerous references in his works for indicating time in terms of astronomy,[6] we may very likely assume that he wrote with authority in the present case as well. In view of the problem of Chaucer's dates and in keeping with the view that Chaucer's knowledge of astronomy was of a high order, we offer for consideration a solution which seems better to fit the conditions established in the sources mentioned. Implicit in the solution is an understanding of the nature of the precession of the equinoxes, i.e., the gradual westward movement of the equinoctial points along the ecliptic. In part II, paragraph 17, of the *Astrolabe*

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[4] Note that Chaucer says that the point of his rule is a little within the degree, indicating the moment of the equinox to fall sometime earlier.

[5] For discussions of the matter, see Robinson, *Geoffrey Chaucer,* p. 651; Walter W. Skeat, ed , *The Complete Works of Geoffrey Chaucer* (2nd edition, Oxford: The Clarendon Press, 1952), V, pp. 2-3; *Englische Studien*, XXXI, 288.

[6] See *"Merchant's Tale,"* IV, 1795, 1885 ff , 2219 ff.; "Squire's Tale," V, 48 ff., 263 ff., 385 ff., 671 ff.; "Franklin's Tale," V, 1018, 1245 ff.; "Parson's Prologue," X, 2 ff.; *Troilus and Criseyde,* II, 905 ff.

Chaucer gives us a method for finding the degree of the zodiac that crosses the meridian with a particular star. Even in Chaucer's time, the signs of zodiac had ceased to coincide with the constellations due to the precession just mentioned. The signs of the zodiac are made up of twelve divisions, each 30° wide, marked eastward from the vernal equinox. The ordering of the zodiac may be described as follows:

> The signs are named from the twelve constellations of the zodiac, which were located in these divisions in the time of Hipparchus, more than two thousand years ago . . . Owing to the precession of the equinoxes, the vernal equinox has moved westward about 30° and the signs have moved with it, away from the constellations after which they were named. When the sun, on March 21, arrives at the vernal equinox, and therefore enters the sign of Aries, it is in the constellation Pisces. The sun does not enter the constellation Aries until the latter part of April.[7]

A glance at a star chart will also show the above example to be the case. Aries, the constellation, which contains the second-magnitude star Hamal, will be found to have at the present time a right ascension of more than two hours, rather than the zero hour which is found at the equinox. The process of equinoctial precession is a continuous one, and it yields a very interesting computation which makes it possible to resolve the problem of Chaucer's dates. The annual change in right ascension of the equinox, and necessarily of the sky as a whole, is 3.07 seconds.[8] With this fact in mind, let us make the following calculations:

Right ascension of Aries (using Hamal), 1967[9]	2 h 5 m 19 s
Rate of annual change in r.a.	3.07 s
Period 1391-1967	576 years

576
x3.07

29 m 28 s, total precession since 1391

Therefore:

Right ascension of Aries (Hamal), 1391	1 h 35 m 51 s
Right ascension of sun on March 12 (old style)	0 h 0 m 0 s
Rate of change in r. a. of sun	4m/day
Date when Hamal and sun would have same r. a.	March 12 plus 24 days

or, April 5, vernal equinox, o. s.

The preceding calculations concern the *constellation* of Aries. The computations for the *sign* of Aries give the following results: The signs are measured from the vernal equinox; therefore, as Chaucer tells us in the *Astrolabe,* the sun would enter the first degree of the *sign* of Aries about March 12, the time of the vernal equinox in 1391. Halfway in the *constellation* of Aries yields a date of April 5 plus fifteen days or April 20, or only two days removed from the second day of the pilgrimage. Of course, it is not necessary to assume that Chaucer in the passage about the "yonge sonne" meant to be mathematically precise in denoting the period when the pilgrims longed to visit Canterbury. If he meant approximately two or three days before the sun had actually finished half its course in the constellation of Aries, the computations could yield an even closer approximation of the date of departure of the pilgrims for Canterbury Cathedral. The conclusions here given are not an attempt to prove that Chaucer necessarily was computing by the constellation of Aries, but that by utilizing an astronomical phenomenon with which he was familiar, he offers us dates that are easily reconcilable.

The star Hamal was chosen for the computations as the most logical choice for the following reasons: Was Hamal considered to be the first point of Aries, or the vernal equinox at the time when the constellations and the signs occupied the same place in the sky? And if not, then what was the first point of Aries? We believe that at the time of the earliest definition of the vernal equinox, Hamal was the star chosen to so designate it. The effect of precession was known to Hipparchus as early as about 125 B. C.[10] In that year the right ascension of Hamal was only about twenty minutes.[11] At any rate, when the sun was on the vernal equinox in 125 B. C., it was less than one-fifth of a degree away from Hamal in right ascension. We are, in addition, encouraged to believe that Hamal was the first point, because it is the brightest star in Aries, and because the declination of Aries in 125 B. C. would have been about 12° N., twice as close to the equinoctial as it is now located.

Part II, paragraph 21, mentions the "almikanteras" of the tables of the astrolabe. This section is of interest because it appears that this set of tables is the ancestor of what is now known to navigators and astronomers as the Rude *Star Finder and Identifier* (Hydrographic Office Publication H.O. 2102-C). With this instrument, knowing the latitude of the observer, the season of the year, and the local time, one can quickly locate any star. The instrument is based on the position of Aries and uses a set of transparent plates, each plate being designed for every ten degrees of latitude.

With the use of the almikanteras of the astrolabe, the predicted azimuth and altitude of a star might be obtained. With this information, little Lewis could gaze up into the sky at the position indicated and locate the star he sought. Like the Rude *Star Finder and Identifier,* the almikanteras were constructed or given latitudes and were shaped to fit into a depression on the back of the astrolabe.

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[7] Robert H. Baker, *Astronomy* (War Department Education Manual Edition) (Washington, D. C.: D. Van Nostrand Company, 1944), pp. 19-20.

[8] *Ibid.*, p. 80.

[9] The "K & E" *Solar Ephemeris,* p. 139.

[10] Baker, *Astronomy,* p. 81.

[11] This figure is obtained by the same process as employed for 1391.

Part II, paragraph 23, is a very interesting portion of the *Astrolabe* in that Chaucer here tells us of a method of finding the latitude of the observer by the height of the "pol artik." This observation rests upon the well-known fact the altitude of the north celestial pole is equal to the latitude of the observer in the northern hemisphere. We have specified *north celestial* not only because that is the pole to which Chaucer refers, since it was the only pole visible to him, but also because there is no star located in the vicinity of the south celestial pole. There has not been an observable star near the south celestial pole in recorded history. The north celestial pole is of great practical benefit today to surveyors and navigators in the determination of latitude. In addition, modern telescopes which are designed to follow the stars by clockwork are oriented on the north celestial pole.

Fortunately, in our day we can use sights of Polaris (alpha Ursae Minor) and apply a simple correction to obtain latitude. The same thing could have been done by Chaucer had there been a correction table. It should be apparent that any star not directly on the north celestial pole must seem to move in a circle around the pole. The radius of this circle is equal (in degrees) to 90° minus the declination of the star concerned.

G. M. Clemence, director of the United States Nautical Almanac, was kind enough to furnish the information that the position of Polaris 1400 had a declination of 86° 02' N.[12] It is evident, therefore, that any single uncorrected observation of Polaris in Chaucer's time could have caused an error in latitude computation of a maximum of 3° 58', which would be 238 nautical miles to the north or south of the observer's true position. Since Polaris has now moved to within less than a degree of the pole, an observation for 1967 would at most be about fifty-seven nautical miles to the north or south of the true position if a correction were not applied.

Even if we were not aware of the early recognition of Polaris as a pole star,[13] we might will suspect it from part II, paragraph 23, of the *Astrolabe*. In this paragraph, Chaucer selects as an illustration of his method a star which he entitles "A." The highest altitude of "A" is 56° and the lowest is 48°. By taking the mean of these two observations, Chaucer obtains 52° as the height of the north celestial pole or the "pol artik." This figure is also, as Chaucer tells us, the latitude of his observation. That star "A" is none other than Polaris is obvious, for the star used for the example moves in a circle of 4° radius (56° minus 52°). In 1391, as we have seen, Polaris moved in a circle of radius 3° 58′. The two figures are so close as to eliminate coincidence. The resemblance of star "A" to Polaris is quite interesting from the viewpoint of accuracy. For even though Chaucer "rounded off" his figures, for purposes of example, as he indicates in part II, paragraphs 22 and 25, he is in error but 2′ or two nautical miles by computation. In modern celestial navigation accuracy to the nearest mile or so is acceptable.

Beyond reasonable doubt the astronomy of the *Astrolabe* is a practical embodiment of what was then known of the heavens, and the phases treated by Chaucer are compatible with many aspects of applied astronomy today. In addition to being perhaps the earliest scientific treatise in English concerning a complicated instrument, it is also ". . . the best explanation of the astrolabe in our language."[14] Certainly in the *Astrolabe* there is no great scheme of theoretical thinking about the stars; any attempt to demonstrate such would be futile. But within the limits of Ptolemaic astronomy, Chaucer's knowledge of celestial activity was considerable. If we are aware that Chaucer had a mastery of the affairs of astronomy which surpassed that possessed by a mere translator, then we must admit that, judged by the standards of the layman in our times, his understanding of the practical results of the study of the stars was extraordinary.

There are those who will disagree, naturally. For instance, one critic is convinced that "so far as Chaucer is concerned all of the astronomy in his poetry could have been obtained from John of Holywood (Sacrobosco) and a good work on the astrolabe with tables." [15] Perhaps this remark is valid in its restricted sense. One cannot apply such a statement to the *Astrolabe* itself.

It is very difficult to imagine that a mere translator, not an astronomer by vocation or avocation, could offer so accurate a treatise on such a complex scientific subject. That Chaucer could do so is but another tribute to the versatility of his genius. Most readers of the *Astrolabe* will agree with Grimm: "There is every reason to suppose that so far as it satisfied his purposes, Chaucer had made himself familiar with the whole literature of the astronomical science."[16]

If there remain some to scoff at medieval star-gazing, let them admit that few persons today who have never practiced astronomical procedure could boast of an assimilation of the facts of the heavens such as Chaucer evidently possessed. Let them be reminded that an astrolabe aided Columbus in his voyages. With the astrolabe and the celestial relationships such as are found in the treatise we have reviewed, Hipparchus had discovered the precession of the equinoxes at a time when that movement had reached the total of only seven minutes of arc. The astrolabe could not measure the infinitesimal changes of the stars with respect to each other, but in its day, it was probably the most accurately designed instrument known.

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[12] In a personal communication dated February 10, 1950.

[13] Polaris was commonly recognized as the pole star by the fourteenth century as attested by an allusion to it as such in Dante's *Divine Comedy* ("Purgatorio," Canto IV).

[14] *The Equatorie of the Planetis*, edited from Peterhouse Manuscript 75. I, by Derek J. Price (Cambridge: Cambridge Universitiy Press, 1955) p. 156

[15] Veazie, "Chaucer's Text-book," p. 171.

[16] Florence M. Grimm, "Astronomical Lore in Chaucer," *University of Nebraska Studies in Language, Literature and Criticism* (1919), No. 2, p. 10.

Finally, it may be said that the astronomy of Chaucer's *Astrolabe* is neither very broad nor very deep—judged by the standards of astronomy in the twentieth century. Yet what there is of astronomy in the *Treatise on the Astrolabe* is technically sound, and it is consistent. The men who plot the courses of the planes and rockets, and the ships which cross the oceans have received an amazing heritage from the medieval poet who pointed his "reule" at the celestial pole.

In 1955 at Cambridge University a manuscript was found entitled *The Equatorie of the Planetis.*[17] Professor Derek J. Price, the editor of the manuscript, offers many strong evidences that the work is very likely by Geoffrey Chaucer. This fascinating manuscript, revealing in its complicated tables a knowledge of astronomy far beyond that of the laymen of the fourteenth century, may be proved in time to be still another evidence to justify the title "learned" which has often been assigned to the author of the *Canterbury Tales.*

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[17] See note 14.

IS DONNE'S METAPHYSICAL POETRY REALLY "METAPHYSICAL"?

by

RAYMOND A. COOK

The poery of John Donne has an unusual fascination for the present-day reader of verse. This fascination may be accounted for in several ways. The school of "New Criticism," so-called, has generally accepted Donne as the high priest of complex metaphor. To this group, Donne's verse represents an expression of the complexity of life which has reached such staggering intricacy as to make such poetry peculiarly appropriate in our time. The term *metaphysical,* which has been most frequently applied to the characteristics of Donne's poetry, has special meanings for the present age, meanings which derive in principle from the Johnsonian definition that metaphysical poetry is that kind having "heterogeneous ideas yoked by violence together." The most frequent characteristics assigned to this type of poetry include metaphor, conceit, and paradox. With these characteristics in mind, it may be profitable to consider some definitions of the *genre* as expressed by several leading exponents of modern criticism.

T. S. Eliot, one of the most significant figures in present-day criticism, considers *metaphysical* as ". . . the elaboration (contrasted with the condensation) of a figure of speech to the farthest stage to which ingenuity can carry it."[1] He further defines the conceit as " . . . primarily an eccentricity of imagery, the farfetched association of the dissimilar, or the overelaboration of one metaphor or simile."[2]

John Crowe Ransom, another speaker for the New Criticism, is more categorical in his definition of metaphysical poetry than is Eliot. He contends that the appreciation of this kind of poetry is the most intellectually satisfying for the reader.[3] Metaphysical poetry to Ransom consists in the main of "a single extended image to bear the whole weight of the conceptual structure."[4]

Another critic, Allen Tate, concurs with Ransom generally, though he does not insist that a conceit be so extended that it is coterminous with the whole structure of the poem. The conceit may be elaborated beyond the usual limits, but does not necessarily have to be so elaborated.[5]

Cleanth Brooks says that metaphysical poetry is based essentially upon the principle of comparison and contrast, and that no true metaphysical poem exists without these qualities. Brooks says also that the metaphysical poet "converges his lines from the farthest distances," which is essentially the *discordia concors* of Dr. Johnson.

Though the above brief definitions and commentaries do not agree in every respect, they are closely enough related to enable us to establish several generalizations about metaphysical poetry. First, the conceit is a fundamental characteristic of such poetry. Second, the poem achieves its force largely through effective use of paradox and extended metaphor. Third, and most pervasive of all, is the quality of complexity of attitude which metaphysical poetry reveals.

After a consideration of the generalizations given above, we may more profitably turn to an analysis of Donne's "A Valediction: Forbidding Mourning," a well-known poem frequently referred to as an example of the true metaphysical style. This poem, like several of Donne's poems, contrasts the spirituality of true love with the worldly, secular standards of inferior love. Donne attempts throughout the poem to reveal that the love which he and his loved one possess is not to be dismayed by separation, for the separation is only apparent, not real.

A Valediction: Forbidding Mourning

1

As virtuous men pass mildly away,
And whisper to their souls, to go,
Whilst some of their sad friends do say,
The breath goes now, and some say, no:

2

So let us melt, and make no noise,
No tear-floods, nor sigh-tempests move,
T'were profanation of our joys
To tell the laity our love.

3

Moving of th'earth brings harms and fears,
Men reckon what it did and meant,
But trepidation of the spheres,
Though greater far, is innocent.

4

Dull sublunary lovers' love
(Whose soul is sense) cannot admit
Absence, because it doth remove
Those things which elemented it.

5

But we by a love, so much refined,
That our selves know not what it is,
Inter-assured of the mind,
Care less, eyes, lips, and hands to miss.

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[1] T. S. Eliot, *Selected Essays 1917-1932* (New York: Harcourt, Brace and Co., 1932), p. 242.

[2] T. S. Eliot, "Donne in Our Time," in *A Garland for John Donne, 1631-1931,* Theodore Spencer; ed. (Cambridge. Harvard U. Press, 1931), p. 16

[3] John Crowe Ransom, *The World's Body* (New York: Charles Scribner's Sons, 1938), p. 135.

[4] John Crowe Ransom, "Honey and Gall," *Southern Review* (1940), VI, 10.

[5] Allen Tate, "A Note on Donne," in *On the Limits of Poetry, Selected Essays: 1928-1948* (New York: Swallow Press, 1948), p. 331.

6

Our two souls therefore, which are one,
Though I must go, endure not yet
A breach, but an expansion
Like gold to airy thinness beat.

7

If they be two, they are two so
As stiff twin compasses are two,
Thy soul the fixed foot, makes no show
To move, but doth, if th'other do.

8

And though it in the center sit,
Yet when the other far doth roam,
It leans, and hearkens after it,
And grows erect, as that comes home.

9

Such wilt thou be to me, who must
Like th'other foot, obliquely run;
Thy firmness makes my circle just,
And makes me end, where I begun.

This poem may be objected to by the casual reader in that the associational images and figures which Donne makes use of may appear to be farfetched and unrelated. If these apparently "farfetched" images did not resolve themselves into unified thought, the objection could no doubt be sustained. A close examination of the poem, however, will reveal a resolution of these distances. It is just such a resolution which must exemplify the "metaphysical" quality of the poem, for obviously a string of unrelated ideas sprinkled about at random in a poem can contribute nothing by way of meaning. What, then, is the nature of Donne's extended associational imagery?

As separation is a kind of death, the poet in parting urges his loved one to "die" with him just as "virtuous" men die "mildly," serene in the knowledge of their pure lives. The poet is prompted to make such a comparison because of the spirituality of their love. We immediately get the idea, then, that the parting is not to be an occasion for sadness, even though a kind of death is involved, and he attempts to justify his position as the poem progresses. The act of dying connotes a sort of dissolution or "melting." The melting immediately suggests a change from a stable state to one less stable, specifically to "tears." But again he says that this change of state is no occasion for the usual lamentations in "tear-floods' and "sigh-tempests." The spiritual quality of their love is too sacred for noisy mourning. As they rank high in the hierarchy of love, it would be profane and sacrilegious to tell the "laity" about it. The lovers must, therefore, be silent, however "moving" their feelings may be. This silence and "movement" now suggest the contrast between the insignificance of the little "moving" earth and the silence of the spheres, whose movements, though infinitely greater than the earth's, are relatively silent and harmless.

Beginning with stanza four, we find what may appear to be an unwarranted transition of ideas. If we keep closely in mind the kind of unconscious associations which grow with the poem, this transition is neither a violent nor an arbitrary one. In the preceding stanza, Donne has been thinking of "spheres," and in stanza five he is merely making an extension of the idea. The word "spheres" brings to mind "sublunary," and Donne contrasts "sublunary" (earthly) love with spiritual love. Earthly love cannot reconcile the absence of a loved one because the lover loves the physical qualities of his loved one, and when these qualities are removed, he has nothing left. Absence removes the physical love, or in Donne's words, "those things which elemented it." This "elementing" action connotes a creative or refining process, and Donne is quick to say in stanza five that their love is "so much refined" that it has become intellectualized and spiritualized so that the qualities of "eyes, lips, and hands" are relatively unimportant.

With the idea of "refining" still in mind, Donne chooses in stanza six an image which is the perfect contrast he is presenting. The most malleable metal which man "refines' is gold, and though it be stretched to "airy thinness," it still maintains its unity by its superior tensility to inferior metals. The stretching then does not cause the "breach" which would occur in a baser metal. By extension of the superior quality of gold, the "golden" quality of their love makes it superior to man's other possessions. The lovers now maintain the kind of unity possessed by gold to "airy thinness beat."

In stanza seven we again arrive at a figure which may be called "farfetched" by some critics. Ostensibly the image of the "twin compasses" may seem to be a far cry from the "gold" of the preceding stanza. Donne has denied the sparation of their souls, but he says that if they *are* separated in another sense, they are as "stiff twin compasses are two," for the two legs of the compasses are united at the pivot. Donne settles upon this brilliant image quite naturally because the compasses represent the idea of duality and unity at the same time, a perfectly parallel concept to what has gone before.

Stanzas eight and nine are excellent in the exactness of imagery which applies equally well to the set of compasses and the relationship of the lovers. The poem maintains the analogy very well through the closing line, and the physical unification of the compasses is parallel to the force which always makes the poet's journey a "circular" one which must always end where it began, "home" in the heart of his loved one.

As we look at the poem in retrospect, we see that it consists of several metaphors variously extended but nevertheless closely knitted together. The lines about the compasses are the most elaborately expanded conceit in the poem, but the burden of the meaning does not depend entirely upon these lines. This last conceit is but an outgrowth of the associational images which rise in the poet's mind. John Crowe Ransom's rather arbitrary definition cannot be applied here, for there is certainly more than one image "to bear the whole weight of the conceptual structure." To refer the poem to another definition previously given, we see that the poem differs from the opinion of T. S. Eliot, for the images are neither "far-fetched" nor "overelaborated." By *over*elaboration one would assume that Eliot means *excessively* elaborated, implying an adverse criticism of the technique. If he means merely "more elaboration than one ordinarily finds in a poem," he might have been happier in his choice of words.

Dr. Johnson's dictum about "heterogeneous ideas" being "yoked by violence" together cannot apply here without qualification because we see upon close reading that the ideas are not heterogeneous at all. On the contrary, they are rather closely related ideas brought together by a process of association perhaps unusual in most poetry, but certainly not by "violence."

Of the various definitions given, those by Allen Tate and Cleanth Brooks seem to be the most nearly applicable to the present poem, but here again Brooks' words about the convergence of lines "from the farthest possible distances" lack proper application to the images in the poem, which are not the farthest possible distance apart.

With the above applications in mind, we are prompted to accept one of two considerations: the definitions are not entirely accurate, or "A Valediction: Forbidding Mourning," though a very fine poem, is not a good example of the metaphysical poetry to which the definitions refer. A very likely resolution of the matter is that the critics probably refer more definitely to that kind of poetry written by the poets of the "School of Donne." Imitations of the Donne style are rarely as successful as the poems of the master of the school. We now must ask: "Is Donne's style of poetry (of which this poem is a good example) metaphysical, or is that poetry by his less successful imitators more properly termed 'metaphysical' "? The latter would appear to be the case, for the general note of "excessiveness" which critics assign to metaphysical poetry can more properly be applied to Donne's imitators than to Donne himself.

BIOGRAPHICAL SKETCH OF RAYMOND A. COOK

Raymond Cook, a native of Columbia County, Georgia received the B. A. and M. A. degrees in English from the University of Georgia, and the Ph.D in English from Emory University. He was the first person to receive the latter degree from Emory. He did additional graduate work at Duke University and the University of North Carolina.

For 11 years he was professor of English at the University of Florida and Georgia State College. In 1961-62, Dr. Cook was appointed as Fulbright Lecturer in American Literature at the University of Shiraz, in Iran, the first person to receive a Fulbright Lectureship at Georgia State College. In the fall of 1962, he was American Coordinator for "Operation Rovan," a worldwide project for rebuilding the town of Rovan in Iran, destroyed in the great earthquake of that year in which 20,000 people died. From 1964-1966 he was president of Young Harris College.

Dr. Cook is the author of numerous articles on such literary figures as John Donne, Robert Frost, Geoffrey Chaucer, Walt Whitman, and Jane Austen; and other articles treating the relationship of science and literature. He is the author of a book of poetry entitled *This The While,* and his study of Thomas Dixon, *Fire From The Flint,* will be published in the fall of 1967. He is also under contract with *Twayne United States Authors Series* for another book in 1968. Among his hobbies are amateur radio and astronomy, in both areas of which he has published. Professor Cook is currently Chairman of the Department of English and Chairman of the Humanities Division at Valdosta State College.

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Robert Hays is Head of the English Department at Southern Technical Institute, Marietta, Georgia. He received his bachelor's degree, *Summa Cum Laude,* from Presbyterian College; his master's degree from Emory University.

During World War II Hays went to sea at age eighteen as an ensign in the United States Navy. At the time of his release to inactive duty he was executive officer and navigator of an amphibious ship. His experience in navigation promoted an interest in the astronomy of the *Astrolabe*.

At Southern Tech Hays specializes in teaching technical writing to future engineering technicians. He combines his academic interests with a part-time career as a free-lance writer of articles for technical trade journals. He has published about a hundred articles in trade magazines and educational journals. He recently published a book on technical writing (Reading, Massachusetts: Addison-Wesley, 1965). Shortly after World War II he published *Pacific Parodies,* a book of poems.

Hays' professional memberships include the American Business Writing Association and a senior membership in the Society of Technical Writers and Publishers. He is currently listed in *Who's Who in American Education, Who's Who in the South and Southwest,* and the *Dictionary of International Biography.*

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